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**FISCAL INCENTIVES AND DISINCENTIVES TO REDUCE PLASTIC WASTE IN INDONESIA**

**Purwoko, Purwoko<sup>1</sup>, Tri, Wibowo<sup>2</sup>**

<sup>1</sup>*Ministry of Finance of the Republic of Indonesia. Fiscal Policy Agency, Jakarta, Indonesia*

<sup>2</sup>*Ministry of Finance of the Republic of Indonesia. Fiscal Policy Agency, Jakarta, Indonesia*

Corresponding author's email: [denmase.purwoko@mail.com](mailto:denmase.purwoko@mail.com), [3wibowo@gmail.com](mailto:3wibowo@gmail.com)

**ABSTRACT**

Indonesia's growing economy causes plastic usage to increase. Consequently, the volume of plastic waste continues to increase over time. In 2015, Indonesia is the second country that pollutes the sea with plastic garbage after China (Jambeck, 2015). The Government of Indonesia is committed to reducing the volume of plastic waste by 30% in 2025, but until now the progress has not been satisfactory. The current development of plastic technology has found environmentally friendly plastic, namely biodegradable plastic which can degrade in a shorter period of time. Technology improvements are still continuing, but there are already visible problems that will become an obstacle, the price of bio-degradable plastics is more expensive than that of non-degradable plastic. People tend to choose non-degradable plastic that is cheap, and avoids biodegradable plastic that is expensive. This study aims to find alternatives of fiscal policies to reduce the volume of plastic waste. This study uses explorative descriptive methodology, in the form of description and explanation of the phenomena that occur in the progress of plastic consumption and production. This study concludes that the combination of incentive and disincentive fiscal policies can be applied to reduce the volume of plastic waste. Fiscal incentives (subsidies) policy can be applied to increase the use of biodegradable plastic and fiscal disincentives (excise) policy can be applied to reduce the use of non-degradable plastic. These policies will not burden the government, will make the plastic waste be degraded faster, and the volume of plastic waste will be reduced significantly.

**Keywords:** excise, biodegradable plastic, fiscal incentive, fiscal disincentive, plastic waste

**1. INTRODUCTION**

Indonesia is the fourth most populous country in the world after China, India and the United States. Based on BPS data, Indonesia's population in 2018 is 265 million, and it is predicted that by 2025 it will rise to 285 million. More than 65 percent of Indonesia's population lives in urban areas. As a country entering the era of bonus demography and supported by stable economic growth, retail transaction activities in Indonesia are growing very rapidly. The negative impact of retail transactions is the use of plastic packaging. This condition is exacerbated by population density in the city causing an increase in the amount of plastic waste. It is estimated, every household in Indonesia produces as much as 0.52 kg / person / day of waste (Jenna R. Jambeck, et al (2015).

High waste production, if not accompanied by good management, will cause pollution. Waste management needs to be supported by adequate facilities and infrastructure. Garbage has the potential to cause environmental disturbances in the form of water, soil and air pollution as well as health and socio-economic disturbances, so cooperation from all parties is needed to overcome the waste problem. (BPS, 2017).

At present, the Indonesian Government's efforts in reducing plastic waste are still focused on the downstream, by issuing various regulations related to waste management that are more focused on managing consumers or the community. Meanwhile, efforts to reduce upstream waste that is more focused on plastic producers have received less attention.



This article wants to examine the extent of fiscal instrument can be used by the Indonesian Government to regulate upstream plastic industry in order to reduce plastic waste, by imposing disincentives to conventional plastic producers and providing incentives for environmentally friendly plastic producers.

## **2. LITERATUR REVIEW**

### **a. Plastic waste**

Plastics are defined as synthetic or semi-synthetic materials which are processed in the form of high molecular weight thermoplastic or thermoset polymers and are formed into films and filaments. Based on the raw materials used, plastics can be grouped into two, namely (1) plastic from non-renewable materials, and (2) plastic from renewable materials. In terms of ease of being degraded by nature, plastics are divided into two, namely (1) plastic that is easily degraded (biodegradable) or bioplastics, and (2) plastics that are difficult to degrade (non-biodegradable) or conventional plastics. Biodegradable plastic is made from vegetable ingredients which are renewable agricultural products. Based on this classification, the best types of plastic are plastic that is processed from renewable material, and easily degraded in nature, namely biodegradable plastic. However, the price of biodegradable plastics is more expensive than conventional plastics because the price of raw materials is more expensive and the technology has not been widely developed (Kamsiati et al., 2017).

Biodegradable plastics are plastics that can be used like conventional plastics, but will be destroyed by microorganism activity into the end product of water and carbon dioxide gas after being used up and discharged into the environment. Because of its nature that can return to nature, biodegradable plastics are environmentally friendly plastics (Fachri and Sartika, 2012). Until now, the packaging industry in Indonesia mostly uses conventional plastic. This causes the condition of plastic waste in Indonesia has entered an alarming stage. As reported by Jambeck (2015), that Indonesia, with plastic waste production of 0.5 to 1.3 million tons per year, was ranked second in the world as the largest producer after China. World Bank (2018a), reports that East Asia is producing waste faster than any other region in the world.

To reduce the use of plastic packaging, according to Santoso W.R. (2013), can be done by: (1) replacing it with other material, cloth or paper, to wrap the goods; (2) plastic waste treatment using fabrication methods; and (3) the use of biodegradable plastic which is more easily biodegradable in nature. The three methods are expected to be a solution for overcoming plastic waste on land and reducing the volume of plastic waste in the sea.

### **b. Fiscal Policy to Regulate Plastics Production**

Excise is a fiscal instrument commonly used to regulate negative externalities from the use of a particular product. As stipulated in Law No. 39 of 2007 concerning excise, there are 4 criteria for goods that are eligible for excise duty, namely goods that (1) their consumption needs to be controlled, (2) their circulation needs to be monitored, (3) their use can have a negative impact on society or the environment, and (4) its use needs to impose state levies for justice and balance. The imposition of excise on plastic meets the third criterion, the use of plastic can have a negative impact on the environment. Excise is a regulation that allows to do earmarking, meaning that the resulting levies can be used to overcome problems that occur in the relevant industrial sector. Excise tax is also possible to provide different rates, so that for plastic waste that is difficult to break down is subject to high tariffs, while for biodegradable plastic waste, low or even negative tariffs are imposed.

Bioplastics magazine (2018) reports that Japanese government plans to support bioplastics next fiscal year by subsidizing commodity manufacturers and groups that are making efforts to



replace petroleum-based plastic products with plant-based ones. To solve these problems, the ministry plans to subsidize companies and universities that make efforts to develop technologies to replace plastic packaging with that made of bioplastics, and to expand and improve facilities in order to increase production of bioplastic items. The ministry will also study methods to collect and dispose of used bioplastic products. It has included ¥ 5 billion (\$ 45 million) in its budgetary request for next fiscal year for these projects.

To reduce plastic waste, according to the World Bank (2018b), it can be done through fiscal policy, in the form of Strengthening regulatory reform and fiscal mechanisms. These mechanisms can include (1) taxes and bans on single-use plastics to correct market inefficiencies, (2) financing mechanisms at the national and local levels, and (3) policies and incentives that encourage manufacturers to design recycled products as well as promote innovation.

### 3. METHODOLOGY

The focus of this study is to find the most appropriate fiscal policy to regulate the plastic industry so that plastic waste can be reduced. This study started with gathering information related to plastic industry and its problems, plastic technology, fiscal policy, plastic waste problems, and environmental issues from journal and other literatures. In addition, this study also gathers information by conducting interviews involving researchers and policy analysts in the Ministry of Finance of Indonesia. After having a comprehensive information on production and consumption of plastic and problems with plastic waste, this study determines appropriate fiscal policy, and explain how it works.

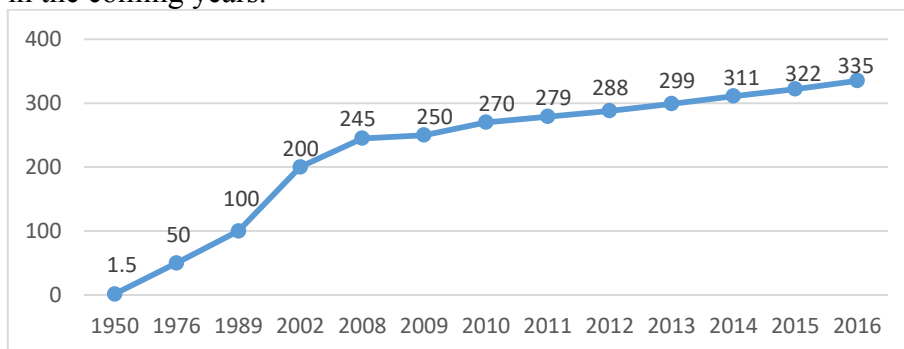
### 4. ANALYSIS

#### a. World Plastic Production

World plastic consumption continues to grow, in line with the growing population, technological developments and the increasing world economy. Figure-1 shows the movement of world plastic production, starting in 1950 by 1.5 million tons, then continued to increase from year to year, reaching 335 million tons in 2016 (Statista.com, 2018).

According to the World Economic Forum (2015), plastics are consumed by various industrial sectors. Figure 2 shows that the three largest plastic consuming sectors are the packaging, Building and Construction, and Textiles sectors, each consuming around 35.9%, 16.0% and 14.5% of the total plastic consumption.

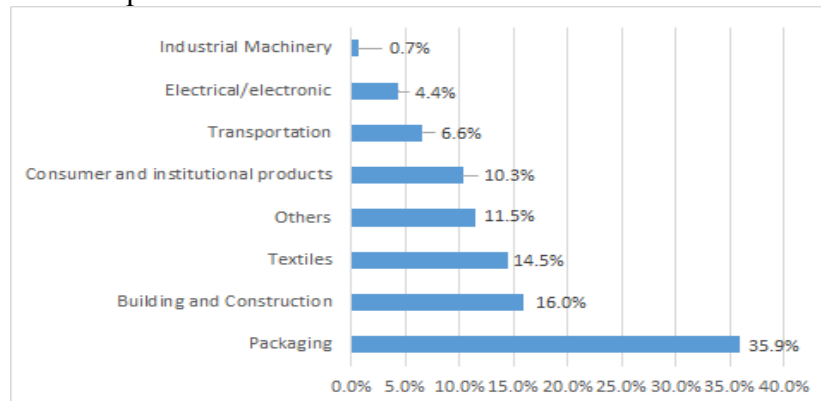
Increasing plastic production has an impact on the increasing volume of plastic waste in the world, because plastic waste takes a long time to decompose. According to World Bank (2018<sup>c</sup>), plastic waste in the sea currently reaches 150 million tons, and is expected to continuously increase in the coming years.



**Figure 1: Growth of World Plastic Production**



Five Asian countries are the world's biggest producers of marine waste, namely China, Indonesia, Vietnam, the Philippines and Thailand (Jambeck 2015). More than half of the world's volume of marine waste is produced in these five countries.



**Figure 2: Plastic Consumption by Industrial Sectors**

**b. Plastic Consumption and Production in Indonesia**

According to the Indonesian Aromatic and Plastic Olefin Association (Inaplas) (2016), Indonesia's plastic consumption per capita in 2015 was 17 kg per person per year. If Indonesia's population in 2018 is 265 million people, it is estimated that Indonesia's plastic consumption will be more than 4.5 million tons. The biggest plastic user in Indonesia is the packaging sector, which reaches 65% of the total national plastic consumption. The nature of packaging products which are generally used once and then discarded, making the production of plastic trash in Indonesia is rapidly increased.

Ministry of Industry data show that in 2018, there were 925 companies engaged in the plastics industry, with a total of 37 327 workers absorbed. Production capacity of 4.68 million tons per year. Most of these companies produce conventional petroleum-based plastics. They compete with each other to sell plastic at low prices.

Some companies have experimented to produce biodegradable plastic made from plant-based raw materials, but they encountered several obstacles: (1) Prices of biodegradable plastic are more expensive, around 200-300% of the price of conventional plastic; (2) Not so many consumers have been educated to use biodegradable plastic. Consumers of biodegradable plastics are still limited; and (3) Most consumers prefer to use conventional plastic which is cheaper.

**c. Indonesian Government Commitment to Reduce Sea Waste Volume**

The Government of Indonesia is very concerned with the results of Jambeck's research (2015), which named Indonesia as a country that throws plastic waste into the sea, second largest after China. As quoted by Greeners.co (2018), the Government of Indonesia, through Presidential Regulation No. 97/2017 has committed to reduce plastic waste by 30% by 2025. Then, through Presidential Regulation No. 83/2018 the Government of Indonesia has committed to handling plastic waste at sea up to 70% in 2025.

Several strategies will be implemented to achieve these objectives, including (1) increasing awareness of stakeholders, (2) improving waste management on land, (3) tackling coastal and marine waste, (4) regulating funding mechanisms, institutional strengthening, supervision and law enforcement, and (5) research and development.

**d. Fiscal Policy to Improve the Biodegradable Plastic Industry**

Indonesian plastic production is still dominated by conventional plastic products that are difficult to degrade in nature. If there is no policy change, the production of plastic waste will continue to increase. Indonesia has committed to reduce household waste by 30% and handle



marine waste up to 70% by 2025. In order to achieve this commitment, there needs to be a policy change in the plastic industry, from conventional plastics to biodegradable plastics. With this policy, the volume of plastic usage does not change, but the volume of degraded waste will increase, and the volume of plastic waste disposed in the sea will decrease.

Plastic producers in Indonesia have the technology to produce biodegradable plastics. However, they are reluctant to produce biodegradable plastic, because the price of biodegradable plastic is more expensive. They cannot compete with conventional plastic producers who sell their products at low prices.

Fiscal policy can play a role in increasing the competitiveness of biodegradable plastics by increasing the price of conventional plastics and reducing the price of biodegradable plastics, so the price is not significantly different. This policy is expected to encourage producers to increase the production of biodegradable plastics and reduce conventional plastic production.

#### **e. Excise as a Fiscal Instrument to Encourage Biodegradable Plastic Production**

Excise is a fiscal instrument commonly used to regulate negative externalities of a certain product. Excise is a regulation that allows earmarking, meaning that the revenue from the excise can be used to overcome problems that occur in the relevant industrial sector. Thus, excise duty can be imposed on conventional plastic and the results are used to provide subsidies for biodegradable plastic.

Simulations in Table 1 provide an illustration of how the excise policy is applied. It is assumed that the total plastic production is 4,500,000 tons, consisting of 90% conventional plastic at a price of \$ 1,000 / ton and 10% biodegradable plastic at a price of \$ 2,000 / ton. Conventional plastic is subject to a 15% excise. This policy will result in excise revenues of \$ 607,500,000.

**Table 1: Simulation of 15% Excise Tax**

		Volume (ton)	Price (USD/ton)	Total Price (USD)	Excise Rate	Excise Revenue (USD)
<b>Plastic Production:</b>		4.500.000,00				
1. Non-Degradable plastic	90%	4.050.000,00	1.000,00	4.050.000.000,00	15%	607.500.000,00
2. Degradable plastic	10%	450.000,00	2.000,00	900.000.000,00		
Price of Non Degradable plastic after Excise			USD	1.150,00		
Expected Price of Degradable plastic			USD	1.150,00		
Subsidy needed per ton of Biodegradable plastic			USD	850,00		
Biodegradable plastic production can be covered by subsidy				714.705,88	ton	
Additional production of biodegradable plastic can be covered by subsidy				264.705,88	ton	

After excise is imposed, conventional plastic price will rise to \$ 1,150. In order to compete, the price of biodegradable plastic is set at the same level of \$ 1,150, so a subsidy of \$ 850 per ton is needed. Excise revenue can be used to provide subsidies of 714,705 tons. If the planned production is 450,000 tons, then there is an additional of 264,705 tons production of biodegradable plastic that can be subsidized.

This policy will make the price of biodegradable plastic balanced with the price of conventional plastic, at \$ 1,150. Consumers must bear an additional burden of 15% from the price of conventional plastic, but they have the option of choosing conventional plastic or biodegradable plastic. Producers have the choice to produce biodegradable plastic by getting a subsidy of \$ 850 per ton or producing conventional plastic by paying excise duty of 15%.

## **5. CONCLUSIONS**

The Indonesian government has a strong commitment to reduce waste production and handle plastic waste in the sea. The use of biodegradable plastic is an appropriate strategy to fulfill this commitment. A number of companies in Indonesia have been able to produce biodegradable plastics. But plastic production is constrained by expensive prices, so it cannot compete with





conventional plastics. Excise is a fiscal policy that can be used to encourage consumers to switch from the use of conventional plastic to biodegradable plastic. Conventional plastics that are difficult to degrade deserve excise duty. The revenue from excise tax is used to subsidize biodegradable plastic. This policy will make the price of conventional plastic rise, and the price of bio-degradable plastics will drop, so the price becomes competitive. With this regulation, producers are expected to be eager to produce biodegradable plastic. Consumers must bear a slight price increase, but they can switch from conventional plastic to biodegradable plastic, because the price is not significantly different.

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